

**LIGHT WEIGHT SIGNAL TRANSMISSION LINES AND RADIO
FREQUENCY ANTENNA SYSTEM**

- 5 A light weight antenna system and corresponding lightweight transmission lines are disclosed that are characterized as having an extremely light weight relative to prior such systems and lines. An inflatable body having an inner surface connected to an outer surface with a plurality of support structures, such as connecting tubes. Antenna elements are
- 10 disposed on the outer surface of the inflatable body to form, for example, a phased array antenna. Coaxial transmission lines are used to transmit signals to and from an antenna element and are, in one embodiment, created by disposing an inner conductor within the aforementioned connecting tubes. Such a transmission line may be utilized in a number of applications, such as
- 15 to connect a base station to an antenna system of a wireless communications network. In another embodiment, quasi coaxial transmission lines are formed by disposing flexible membrane shields around a transmission elements.